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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,929	12/10/2003	Thomas Kemp	282711US8X	6660

22850 7590 09/11/2007

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EXAMINER	
GODBOLD, DOUGLAS	

ART UNIT	PAPER NUMBER
2626	

NOTIFICATION DATE	DELIVERY MODE
09/11/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)
	10/731,929	KEMP ET AL.
	Examiner	**Art Unit**
	Douglas C. Godbold	2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *01 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 12-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 12-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to correspondence filed August 1, 2007 in reference to application 10/731,929. Claims 1-9, and 12-14 are pending in the application and have been examined.

Response to Amendment

2. The amendments to the claims filed August 1, 2007, have been examined and considered in this office action. Claims 10 and 11 have been cancelled, and claim 12-14 have been added.

Response to Arguments

3. Applicant's arguments filed August 1, 2007 have been fully considered but they are not persuasive.

4. With regards to claims 1, 9 and 12, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the details of what exactly is the "Absolute Loudness") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). For the purposes of this office action, absolute loudness will be interpreted as the amplitude of the received speech.

5. With regards to claim 3, that Gable et al is not combinable with Lee et al, the examiner respectfully disagrees. Gable clearly uses parameters including amplitude of the signal to verify speaker identity paragraph 0027. This is similar to the system of lee, and therefore it is combinable. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

6. With regards to claim 6, that Brandstein does not teach how to determine the absolute loudness using auditory and binaural processing, the examiner respectfully disagrees. The relationship on page 21 relates Amplitude as a function of distance from the source, which is usable to determine the amplitude at the source. Given the detected amplitude and the source location, which can be detected using the source localization method described throughout the paper, one of ordinary skill in the art could clearly determine the amplitude of the sound at the source.

7. With regards to claim 8, that Brandstein does not teach using the arrival times of the speech signal between two or more microphones, the examiner respectfully disagrees. The quote used by the applicant from Brandstein has been misunderstood. The applicant uses "There is no attempt made to define time-difference of arrival (TDOA) values relative to a single reference sensor or an absolute scale;" page 3, line 1. This is merely referring to one way TDOA can be obtained. Throughout the paper, for example T() in equation 5 on page 6, TDOA estimates are used in the method of determining the location of the source. Therefore it is clear that Brandstein does in fact use TDOA in determining location.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> **The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.**

9. Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 14 recites the limitation, "said microphone" in line 6 of the claim. However, it is unclear is to which microphone this applies, as the previously the claim mentions only "two or more microphones."

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1, 2, 9, 10, 11, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. (Recognition of Negative Emotions from the Speech Signal).

12. Consider claim 1, Lee teaches a method for processing speech (This paper reports on methods for automatic classification of spoken utterances based on the emotional state of the speaker; page 240, column 2, lines 3-4.), comprising the steps of:

receiving a speech input of a speaker (The speech data used in the experiments was obtained from real users engaged in a spoken dialog with a machine agent over the telephone; page 241, column 1, lines 5-7.),

generating speech parameters from said speech input (In our experiments, we computed only acoustic features such as pitch and energy related features from the speech signal; page 241, column 2, lines 46-47.),

determining parameters describing an absolute loudness of said speech input (The acoustic features chosen for emotion recognition comprised utterance-level statistics obtained from the pitch and energy information of the signal. These included mean median, standard deviation, maximum and minimum for energy; page 241, column 1, lines 57-61. Energy is the amplitude, and therefore the loudness of the signal.),

evaluating said speech input and/or said speech parameters using said parameters describing the absolute loudness (This paper reports on methods for

automatic classification of spoken utterances based on the emotional state of the speaker; using utterance level features; page 240, column 2, lines 3-13.).

13. Consider claim 2, Lee teaches a method according to claim 1, wherein the step of evaluation comprises a step of emotion recognition (This paper reports on methods for automatic classification of spoken utterances based on the emotional state of the speaker; page 240, column 2, lines 3-4.).

14. Consider claim 9, Lee teaches a speech processing system (This paper reports on methods for automatic classification of spoken utterances based on the emotional state of the speaker; page 240, column 2, lines 3-4.), configured to:

receive a speech input of a speaker (The speech data used in the experiments was obtained from real users engaged in a spoken dialog with a machine agent over the telephone; page 241, column 1, lines 5-7.),

generate speech parameters from said speech input (In our experiments, we computed only acoustic features such as pitch and energy related features from the speech signal; page 241, column 2, lines 46-47.),

determine parameters describing an absolute loudness of said speech input (The acoustic features chosen for emotion recognition comprised utterance-level statistics obtained from the pitch and energy information of the signal. These included mean median, standard deviation, maximum and minimum for energy; page 241, column 1, lines 57-61. Energy is based the amplitude, and therefore the loudness of the signal.),

evaluate said speech input and/or said speech parameters using said parameters describing the absolute loudness (This paper reports on methods for automatic classification of spoken utterances based on the emotional state of the speaker; using utterance level features; page 240, column 2, lines 3-13.).

15. Consider claim 12, Lee teaches a computer readable medium encoded with a computer program configure to cause a processor based device to execute the method of: (This paper reports on methods for automatic classification of spoken utterances based on the emotional state of the speaker; page 240, column 2, lines 3-4. a computer readable medium is inherent as this is computer based.):

receiving a speech input of a speaker (The speech data used in the experiments was obtained from real users engaged in a spoken dialog with a machine agent over the telephone; page 241, column 1, lines 5-7.),

generating speech parameters from said speech input (In our experiments, we computed only acoustic features such as pitch and energy related features from the speech signal; page 241, column 2, lines 46-47.),

determining parameters describing an absolute loudness of said speech input (The acoustic features chosen for emotion recognition comprised utterance-level statistics obtained from the pitch and energy information of the signal. These included mean median, standard deviation, maximum and minimum for energy; page 241, column 1, lines 57-61. Energy is the amplitude, and therefore the loudness of the signal.),

evaluating said speech input and/or said speech parameters using said parameters describing the absolute loudness (This paper reports on methods for automatic classification of spoken utterances based on the emotional state of the speaker; using utterance level features; page 240, column 2, lines 3-13.).

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

18. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Gable et al. (US PAP 2005/0060153).

19. Consider claim 3, Lee teaches the method according to claim 1 but does not specifically teach wherein the step of evaluation comprises á step of speaker identification.

In the same field of speech processing, Gable teaches a step of speaker identification using similar acoustic features as described by Lee (Verification parameters represent the individuality of the speaker, containing information about the timing, pitch, amplitude or spectral content of the speech; paragraph 0027. Abstract discusses using these features for speaker verification.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to provide speaker identification as taught by Gable, with the speech processing of Lee in order to provide a method of further classifying a speech signal beyond emotional classification.

20. Claims 4-8, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Brandstein et al. (Microphone Array Localization Error Estimation with Application to sensor Placement).

21. Consider claim 4, Lee teaches a method according to claim 1 but does not specifically teach wherein a microphone array comprising a plurality of microphones is used for determining said parameters describing the absolute loudness.

In the same field of speech processing, Brandstein teaches using a microphone array comprising a plurality of microphones (see figure 6) for determining said parameters describing the absolute loudness (Existing array systems have been used in a number of applications. These include teleconferencing, speech recognition, speaker identification, speech acquisition in an automobile environment, sound capture in

reverberant enclosures, large room recordings, conferencing, acoustic surveillance, and hearing aid devices; page 1 lines 11-15. Obviously, the array of microphones would be used to determine the parameters including loudness needed for these applications.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a microphone array as taught by Brandstein with the speech processing system of Lee in order to provide a means for provide a high quality signal of the desired speaker (Introduction, Brandstein.).

22. Consider claim 5, Lee teaches a method according to claim 1 but does not specifically teach wherein a location and/or distance of the speaker is determined.

But in the same field of speech processing Brandstein teaches determining a location and/or distance of the speaker (Section 2 discusses using a microphone array with a time difference of arrival algorithm to determine a location of a speaker; pages 3-5.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a microphone array for source location as taught by Brandstein with the speech processing system of Lee in order to provide a means for provide a high quality signal of the desired speaker (Introduction, Brandstein.).

23. Consider claim 6, Lee teaches a method according to claim 1 but does not specifically teach that the absolute loudness is determined using algorithms for auditory and/or binaural processing.

In the same field of speech signal processing, Brandstein teaches that the absolute loudness is determined using algorithms for auditory and/or binaural processing (Page 21 teaches modeling a source as a cardioid radiator, wherein the source amplitude is a function of distance from the source. When this information is combined with the source locating algorithms of section 2, one can obviously estimate the amplitude at the source itself given the amplitude at the microphone array.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the method of level determination as suggested by Brandstein with the speech processing of lee in order to provide a more accurate representation of the actual level at the source providing a better means for more accurately categorizing a speech signal.

24. Consider claim 7, Brandstein teaches a method according to claim 5, wherein said absolute loudness is computed by normalizing a measured loudness, or energy by said distance (Page 21 provides a relationship of a source amplitude as a function of distance and angle form the source. This relationship could obviously be used to normalize an amplitude value to estimate the amplitude at the source.)

25. Consider claim 8, Brandstein teaches a method according to claim 5, wherein said distance is determined using the time delay of the speech input between said plurality of microphones (Sections 2 and 3 discuss using a microphone array with a time difference of arrival algorithm to determine a location of a speaker; pages 3-10.)

26. Consider claim 13, Lee teaches a method for processing speech, comprising:

receiving a speech signal of a speaker (The speech data used in the experiments was obtained from real users engaged in a spoken dialog with a machine agent over the telephone; page 241, column 1, lines 5-7.);

generating speech parameters from said speech signal (In our experiments, we computed only acoustic features such as pitch and energy related features from the speech signal; page 241, column 2, lines 46-47.); and

evaluating at least one of said speech signal and said speech parameters using the normalized loudness or energy (This paper reports on methods for automatic classification of spoken utterances based on the emotional state of the speaker; using utterance level features; page 240, column 2, lines 3-13.).

However Lee does not specifically teach:

determining a distance of the speaker based on a time delay of a respective arrival of said speech signal at two or more microphones; and

normalizing a measured loudness or energy by said distance.

In the same field of speech processing, Brandstein teaches determining a distance of the speaker based on a time delay of a respective arrival of said speech signal at two or more microphones (Sections 2 and 3 discuss using a microphone array with a time difference of arrival algorithm to determine a location of a speaker; pages 3-10.); and

normalizing a measured loudness or energy by said distance (Page 21 provides a relationship of a source amplitude as a function of distance and angle form the source. Although this relationship was given to model the source, one of ordinary skill in the art at the time of the invention would have thought, given the location of the source (as determined in the localization method discussed throughout Brandstein) and the detected amplitude at the microphone array, to use the relationship to determine the source amplitude).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a microphone array for source location as taught by Brandstein with the speech processing system of Lee in order to provide a means for provide a high quality signal of the desired speaker that is not adversely effected by the distance from a speaker to the microphone array. (Introduction, Brandstein.).

27. Consider claim 14, Lee teaches a system for emotion recognition and/or speaker identification, comprising:

a data processor configured to generate speech parameters from said speech signal (In our experiments, we computed only acoustic features such as pitch and energy related features from the speech signal; page 241, column 2, lines 46-47.), and

further configured to evaluate at least one of said speech signal and said speech parameters using the normalized loudness or energy (This paper reports on methods for automatic classification of spoken utterances based on the emotional state of the speaker; using utterance level features; page 240, column 2, lines 3-13.).

However Lee does not specifically teach:

at least two microphones configured to receive a speech signal; and

a processor configured to determine a distance of the speaker based on a time delay of a respective arrival of said speech signal at said microphone, to normalize a measured loudness or energy by said distance.

In the same field of speech processing Brandstein teaches:

at least two microphones configured to receive a speech signal (see microphone array in figure 6); and

a processor configured to determine a distance of the speaker based on a time delay of a respective arrival of said speech signal at said microphone (Sections 2 and 3 discuss using a microphone array with a time difference of arrival algorithm to determine a location of a speaker; pages 3-10.), to normalize a measured loudness or energy by said distance (Page 21 provides a relationship of a source amplitude as a function of distance and angle form the source. Although this relationship was given to model the source, one of ordinary skill in the art at the time of the invention would have thought, given the location of the source (as determined in the localization method discussed throughout Brandstein) and the detected amplitude at the microphone array, to use the relationship to determine the source amplitude).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a microphone array for source location as taught by Brandstein with the speech processing system of Lee in order to provide a means for provide a

high quality signal of the desired speaker that is not adversely effected by the distance from a speaker to the microphone array. (Introduction, Brandstein.).

Conclusion

28. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas C. Godbold whose telephone number is (571) 270-1451. The examiner can normally be reached on Monday-Thursday 7:00am-4:30pm Friday 7:00am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DCG

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PRIMARY EXAMINER